CLAIMS

1. A composition comprising two or more isolated polynucleotides, wherein each of said two or more isolated polynucleotides is selected from the polynucleotides of Table 11 or a sequence which hybridizes under high stringency conditions thereto.

2. The composition of claim 1, wherein said each of said two or more isolated polynucleotides is differentially expressed in an animal subjected to pain relative to an animal not subjected to said pain by at least 1.2 fold across at least three replicate screens of neuronal tissue of an animal subjected to pain with a P-value of less than 0.05.

3. The composition of claim 1, wherein said each of said two or more isolated polynucleotides is differentially expressed by at least 1.4 fold in the neuronal tissue of an animal subjected to pain relative to said animal not subjected to said pain.

4. The composition of claim 1, wherein said each of said two or more isolated polynucleotides is differentially expressed by at least 2 fold in the neuronal tissue of an animal subjected to pain relative to said animal not subjected to said pain.

5. The composition of claim 1, wherein said neuronal tissue is selected from the group consisting of sensory neurons of the dorsal root ganglion, and dorsal horn neurons.

6. A plurality of vectors each comprising an isolated polynucleotide, wherein each of said isolated polynucleotides is selected from Table 11, or a sequence which hybridizes under high stringency conditions thereto.

7. A plurality of viral vectors each comprising an isolated polynucleotide, wherein each of said isolated polynucleotides is selected from Table 11, or a sequence which hybridizes under high stringency conditions thereto.

8. A host cell comprising the vectors of claim 6 or 7.

9. An array consisting essentially of:

(a) a plurality of polynucleotide members, wherein each of said polynucleotide members is selected from Table 11; and

(b) a solid substrate, wherein each polynucleotide member has a unique position on said array and is stably associated with said solid substrate.

10. An array comprising:

(a) a plurality of polynucleotide members, wherein each of said polynucleotide members is selected from Table 11, and wherein said plurality of polynucleotide members are obtained from neuronal tissue obtained from at least two different species of animal; and

(b) a solid substrate, wherein each polynucleotide member obtained from each of said two different species has a unique position on said array and is stably associated with said solid substrate.

11. The array of claim 9 or 10, wherein said plurality of polynucleotide members is differentially expressed by at least 1.2 fold across at least three replicate screens of neuronal tissue of an animal subjected to pain with a P-value of less than 0.05 relative to an animal not subjected to said pain.

12. The array of claim 9 or 10, wherein said plurality of polynucleotide members is differentially expressed by at least 1.4 fold in the neurons of said animal subjected to pain relative to an animal not subjected to said pain.

13. The array of claim 9 or 10, wherein said array comprises from 10 to 20,000 polynucleotide members.

14. The array of claim 9 or 10, further comprising negative and positive control sequences and quality control sequences selected from the group consisting of cDNA sequences encoded by housekeeping genes, plant gene sequences, bacterial sequences, PCR products and vector sequences.

15. A method of identifying an agent that increases or decreases the expression of a polynucleotide sequence that is differentially expressed in neuronal tissue of a first animal which is subjected to pain comprising:

(a) administering said agent to said first animal;

(b) hybridizing nucleic acid isolated from one or more sensory neurons of said first and a second animal to the array of claim 9 or 10; and

(c) measuring the hybridization of said nucleic acid isolated from said neuronal tissue of said first and second animal to said array; wherein an increase in hybridization of said nucleic acid from said first animal to one or more nucleic acid members of said array relative to hybridization of said nucleic acid from a second animal which is subjected to pain but to which is not administered said agent to one or more nucleic acid members of said array identifies said agent as increasing the expression of said polynucleotide sequence, and wherein a decrease in hybridization of said nucleic acid from said first animal to one or more nucleic acid members of said array relative to the hybridization of said nucleic acid from second animal to one or more nucleic acid members of said array identifies said agent as decreasing the expression of said polynucleotide sequence.

16. The method of claim 15, further comprising the step of verifying the increase or decrease in said hybridization by a molecular procedure selected from the group consisting of Northern analysis, *in situ* hybridization, and PCR.

17. The method of claim 15, further comprising the step of labeling the nucleic acid sample isolated from said first and second animal with a detectable label prior to said hybridization to said array.

18. The method of claim 17, wherein the nucleic acid sample isolated from said first animal is labeled with a different detectable label than the nucleic acid sample isolated from said second animal.

19. A method for identifying a compound which regulates the expression of a polynucleotide sequence which is differentially expressed in an animal subjected to pain, comprising:

(a) providing a cell comprising and capable of expressing one or more of the differentially expressed polynucleotide sequences shown in Table 11;

(b) contacting said cell with a candidate compound; and

(c) measuring the expression of said one or more of the polynucleotide sequences shown in Table 11, wherein an increase or decrease in the expression of said one or more of the polynucleotide sequences shown in Table 11 of at least 10% is indicative of regulation of said differentially expressed polynucleotide sequence.

20. A method for identifying a compound which increases or decreases pain in an animal, comprising:

(a) providing a cell comprising one or more of the polypeptides shown in Table 11;

(b) contacting said cell with a candidate compound; and

(c) measuring the activity of said one or more polypeptides, wherein an increase or decrease of the activity of said one or more polypeptides of at least 10% relative to the activity of said one or more polypeptides in said cell, wherein the cell is not contacted with the candidate compound, identifies said candidate compound as a compound which increases or decreases pain in an animal.

21. The method of claim 20, wherein said candidate compound is selected from the group consisting of small molecule, protein, RNAi, and antisense.

22. The method of claim 20, wherein said candidate compound is an antibody which binds to said polypeptide.

23. A method for producing a pharmaceutical formulation comprising:

(a) providing a cell comprising said one or more of the polypeptides shown in Table 11;

(b) selecting a compound which regulates the activity of said one or more polypeptides; and

(c) mixing said compound with a carrier.

24. The method of claim 23, wherein said step of selecting comprises the steps of

(a) contacting said cell with a candidate compound; and

(b) measuring the activity of said one or more polypeptides, wherein an increase or decrease of the activity of said one or more polypeptides of at least 10% relative to the activity of said one or more polypeptides in said cell, wherein the cell is not contacted with the candidate compound, identifies said candidate compound as a compound which regulates the activity of said one or more polypeptides

25. A method for identifying a compound which increases or decreases pain in an animal, comprising:

(a) administering a candidate compound to an animal comprising one or more of the polypeptides shown in Table 11; and

(b) measuring the activity of said one or more polypeptides wherein an increase or decrease of the activity of said polypeptide of at least 10% relative to the activity of said one or more polypeptides in an animal to which the candidate compound is not administered, identifies said candidate compound as a compound which increases or decreases pain in an animal.

26. The method of claim 25, wherein said candidate compound is selected from the group consisting of small molecule, protein, RNAi, and antisense.

27. The method of claim 25, wherein said candidate compound is an antibody which binds to said polypeptide.

28. A method for identifying a small molecule which increases or decreases pain in an animal, comprising:

(a) providing a cell comprising one or more of the polypeptides indicated in Table 11;

(b) generating a small molecule library;

(c) providing a candidate small molecule, selected from said library;

(d) contacting said cell with said candidate small molecule; and

(e) measuring the activity of said one or more polypeptides, wherein an increase or decrease of the activity of said one or more polypeptides of at least 10% relative to the activity of said one or more polypeptides in said cell, wherein the cell is not contacted with the candidate small molecule, identifies said candidate small molecule as a small molecule which increases or decreases pain in an animal.

29. The method of claim 28, wherein said small molecule library comprises components selected from the group consisting of heterocyclics, aromatics, alicyclics, aliphatics, steroids, antibiotics, enzyme inhibitors, ligands, hormones, alkaloids, opioids, terpenes, porphyrins, toxins, and catalysts, and combinations thereof.

30. A method for identifying a compound useful in the treatment of pain, comprising:

(a) providing a host cell comprising a vector comprising one or more of the polynucleotides identified in Table 11;

(b) maintaining said host cell under conditions which permit the expression of said one or more polynucleotides;

(c) selecting a compound which regulates the activity of a polypeptide encoded by said one or more polynucleotides;

(d) administering said compound to an animal subjected to pain; and

(e) measuring the level of pain in said animal, wherein a decrease in the level of pain in said animal of at least 10%, identifies said compound as being useful for treating pain.

31. The method of claim 30, wherein said step of selecting includes the steps of

(a) contacting said cell with a candidate compound; and

(b) measuring the activity of the polypeptide encoded by said one or more polynucleotides, wherein an increase or decrease of the activity of said polypeptide of at least 10% relative to the activity of said polypeptide in said cell, wherein the cell is not contacted with the candidate compound, identifies said candidate compound as a compound which regulates the activity of said polypeptide.

32. A method for producing a pharmaceutical formulation comprising:

(a) providing a cell comprising one of more polypeptides as shown in Table 11;

(b) maintaining said cell under conditions which permit the expression of said one or more polynucleotides;

(c) selecting a compound which regulates the activity of a polypeptide encoded by said one or more polynucleotides, wherein an increase or decrease of the activity of said polypeptide of at least 10% relative to the activity of said one or more polypeptides in an animal to which the candidate compound is not administered, identifies said candidate compound as a compound which regulates the activity of said one or more polypeptides;

(d) administering said compound to an animal subjected to pain;

(e) measuring the level of pain in said animal, wherein a decrease in the level of pain in said animal of at least 10%, identifies said compound as decreasing pain; and

(f) mixing said compound with a carrier.

33. A method of treating pain in an animal comprising administering to said animal an antisense polynucleotide capable of inhibiting the expression of one or more of the polynucleotide sequences indicated in Table 11.

34. A method of treating pain in an animal comprising administering to said animal a double stranded RNA molecule wherein one of the strands of said double stranded RNA molecule is identical to a portion of an mRNA transcript obtained from one or more of the polynucleotide sequences indicated in Table 11.

35. A method of treating pain in an animal in need thereof, comprising:

administering a therapeutically effective amount of an antibody which binds to one or more of the polypeptides indicated in Table 11.

36. A method of treating pain in an animal in need thereof, comprising:

administering a therapeutically effective amount of one or more of the polypeptides indicated in Table 11.

37. A method of detecting pain in an animal suspected of having pain comprising:

measuring the amount of one or more of the polynucleotide sequences of Table 11 in said animal, wherein if said amount of said one or more polynucleotides is increased or decreased by at least 1.2 fold across at least three replicate screens and is statistically significant at $P<0.05$ in said animal compared to the amount of said one or more polynucletoide sequences of Table 11 in an animal not suspected of having pain, then pain is detected in said animal suspected of having pain.

38. The method of claim 37 wherein the amount of said polynucleotide sequence is increased or decreased by at least 1.4 fold.

39. The method of claim 37, wherein said amount of said one or more polynucleotide sequences is measured in one or more sensory neurons.

40. The method of claim 39, wherein said sensory neurons are selected from the group consisting of dorsal horn neurons and dorsal root ganglion neurons.

41. The method of claim 37, wherein said amount of said one or more polynucleotide sequences is measured in a patient sample.

42. A method of detecting pain in an animal suspected of having pain comprising:

measuring the amount of one or more of the polypeptide sequences of Table 11 in said animal, wherein if said amount of said one or more polypeptides is increased or decreased by at least 1.2 fold across at least three replicate screens and is statistically significant at $P<0.05$ in said animal compared to the amount of said one or more polypeptide sequences of Table 11 in an animal not suspected of having pain, then pain is detected in said animal suspected of having pain.

43. The method of claim 42, wherein said amount of said one or more polypeptide sequences is measured in one or more sensory neurons.

44. The method of claim 43, wherein said sensory neurons are selected from the group consisting of dorsal horn neurons and dorsal root ganglion neurons.

45. The method of claim 42, wherein said amount of said one or more polypeptide sequences is measured in a patient sample.

46. The method of claim 42, wherein the amount of said polypeptide sequence is increased or decreased by 1.4 fold.